That which is claimed is:

1. A process for purification of an aromatic monomer such as is produced by catalytic dehydrogenation of an alkylated aromatic compound which process comprises:

providing a feedstock comprising at least one substituted aromatic monomer of from 8 to about 18 carbon atoms in which a substituent moiety is ethylenically unsaturated and impurities comprising at least one substituted aromatic compound having the same or similar carbon content in which a substituent moiety is acetylenically unsaturated in an amount of more than about 100 parts per million based upon the total amount of aromatic monomer present and optionally saturated hydrocarbon compounds;

passing the feedstock through a particulate bed of adsorbent comprising predominantly a support material having high surface area on which is dispersed at least one metallic element in the zero valent state selected from the group consisting of chromium, iron, cobalt, nickel, copper, ruthenium, palladium, silver and platinum, to effect, under conditions suitable for adsorption within the bed, to effect, in the presence of an essentially dihydrogen-free atmosphere within the bed, selective adsorption and/or complexing of the contained impurities with the adsorbent, and thereby obtain purified effluent which contains less than about 100 parts per million of the acetylenically unsaturated impurity; and

thereafter regenerating the resulting bed of adsorbent in the presence of a reducing gas comprising dihydrogen to effect release of the contained impurities from the adsorbent.

2. The process according to claim 1 wherein the aromatic monomer is selected from the group consisting of styrene, n-propylbenzene, divinylbenzene, vinyl toluene, t-butyl styrene and p-methylstyrene.

3. The process according to claim 1 wherein the support is a material selected from the group consisting of alumina, silica, active carbon, clay and zeolites, and has surface area in a range of

from about 10 to about 2,000 square meters per gram as measured by the BET gas adsorption method.

4. The process according to claim 3 wherein the metal dispersed on the support material is at least one element selected from the group consisting of iron, cobalt, nickel, copper, palladium, silver and platinum, and the absorbent has a dispersed metal content in a range of from about 0.01 to about 10 percent based on the total weight of the adsorbent.

5. The process according to claim 4 wherein the liquid mixture passes though the bed of particulate adsorbent at liquid hourly space velocities in a range of from about 0.5 $hours^{-1}$ to about 50 $hours^{-1}$.

6. The process according to claim 1 wherein the adsorbent comprises at least about 90 weight percent of a gamma alumina having surface area in a range of from about 80 to about 500 square meters per gram as measured by the BET gas adsorption method.

7. The process according to claim 6 wherein the metal dispersed on the support material is palladium, and the absorbent has a palladium content in a range of from about 0.01 to about 10 percent based on the total weight of the adsorbent.

8. The process according to claim 1 wherein the aromatic monomer in the liquid mixture being purified is predominantly an aromatic monomer selected from the group consisting of styrene and vinyl toluene, the liquid mixture contains less than about 0.5 parts per million by volume of hydrogen and less than about 1 parts per million by volume of mercury-containing, arsenic-containing, and sulfur-containing components, each calculated as the element, and wherein the gaseous mixture, while passing through the bed, is at temperatures in a range of from about 5°C to about 75°C.

9. The process according to claim 8 wherein the adsorbent comprises at least about 90 weight percent of a gamma

alumina having surface area in a range of from about 150 to about 350 square meters per gram as measured by the BET gas adsorption method, and wherein the metal dispersed on the support material is palladium, and the absorbent has a palladium content in a range of from about 0.01 to about 10 percent based on the total weight of the adsorbent.

10. The process according to claim 1 wherein the adsorbent has a metal dispersion value of at least 10 percent as measured by carbon monoxide chemisorption method.

11. A process for recovery of a high purity styrene monomer from a feedstock produced by catalytic dehydrogenation of ethylbenzene which process comprises:

passing a feedstock comprising predominantly styrene and impurities comprising phenyacetylene in an amount of more than about 100 parts per million based upon the total amount of styrene present and optionally ethylbenzene through a particulate bed of adsorbent comprising predominantly a support material selected from the group alumina, silica, active carbon, clay and zeolites having surface area in a range of from about 10 to about 2,000 square meters per gram as measured by the BET gas adsorption method, on which is dispersed at least one metallic element selected from the group consisting of chromium, iron, cobalt, nickel, copper, ruthenium, palladium, silver and platinum, to provide an effluent stream from the bed;

effecting, in the presence of an essentially dihydrogen-free atmosphere within the bed, selective and reversible adsorption and/or complexing of the contained impurities with the adsorbent, until levels of the phenyacetylene impurity in the effluent stream increase to a predetermined level in a range downward from about 20 parts per million by volume; and

thereafter regenerating the resulting bed of adsorbent in the presence of a reducing gas comprising dihydrogen to effect release of the contained impurities from the adsorbent.

12. The process according to claim 1 wherein the aromatic monomer is selected from the group consisting of styrene, n-

propylbenzene, divinylbenzene, vinyl toluene, t-butyl styrene and p-methylstyrene.

13. The process according to claim 11 wherein the support is a material selected from the group consisting of alumina, silica, carbon clay and zeolites, and has surface area in a range of from about 10 to about 2,000 square meters per gram as measured by the BET gas adsorption method.

14. The process according to claim 13 wherein the metal dispersed on the support material is at least one element selected from the group consisting of iron, cobalt, nickel, zinc, ruthenium, palladium, platinum, and potassium, and the absorbent has a dispersed metal content in a range of from about 0.01 to about 10 percent based on the total weight of the adsorbent.

15. The process according to claim 14 wherein the liquid mixture passes though the bed of particulate adsorbent at liquid hourly space velocities in a range of from about 1.0 $hours^{-1}$ to about 30 $hours^{-1}$.

16. The process according to claim 11 wherein the adsorbent comprises at least about 90 weight percent of a gamma alumina having surface area in a range of from about 80 to about 500 square meters per gram as measured by the BET gas adsorption method, and contains less than 500 parts per million by weight of a sulfur-containing component, calculated as elemental sulfur.

17. The process according to claim 16 wherein the metal dispersed on the support material is palladium, and the absorbent has a palladium content in a range of from about 0.01 to about 10 percent based on the total weight of the adsorbent.

18. The process according to claim 11 wherein the olefin in the gaseous mixture being purified is predominantly ethylene or propylene, the gaseous mixture contains less than about 0.5 parts per million by volume of hydrogen and less than about 1 parts per million by volume of mercury-containing, arsenic-

containing, and sulfur-containing components, each calculated as the element, and wherein the gaseous mixture, while passing through the bed, is at temperatures in a range of from about 5°C to about 75°C.

19. A process for recovery of a high purity aromatic monomer from a feedstock produced by catalytic dehydrogenation of an alkylated benzene which process comprises:

passing a feedstock comprising at least about 98 percent by volume of an aromatic monomer selected from the group consisting of styrene, methyl phenyl ethylene, vinyl toluenes, vinyl chlorobenzene, t-butylbenzene, n-propylbenzene and divinylbenzene, and dehydrogenated impurities comprising one or more members of the group consisting of phenylacetylene, methyl phenylacetylene, tolylacetylene, (vinylphenyl)acetylene, chloracetylene and t-butylphenyl)acetylene in an amount of about 100 to about 1000 parts per million based upon the total amount of monomer present through a particulate bed of adsorbent comprising predominantly through a bed of adsorbent which is free of a substantial amount of carbon monoxide, the adsorbent comprising at least about 90 weight percent of gamma alumina having surface area in a range of from about 150 to about 350 square meters per gram as measured by the BET gas adsorption method, on which is dispersed is at least one element selected from the group consisting of iron, cobalt, nickel, copper, palladium, silver and platinum, in the zero valent state, to effect, under conditions suitable for adsorption within the bed, selective adsorption and/or complexing of the contained impurities with the adsorbent, thereby obtaining an effluent steam of feedstock which contains less than about 10 parts per million by volume of the dehydrogenated impurities;

effecting, in the presence of an essentially dihydrogen-free atmosphere within the bed, selective adsorption and/or complexing of one or more of the contained impurities with the adsorbent, until levels of the impurities in the effluent stream

increase to a limiting level in a range downward from about 10 parts per million by weight; and

thereafter regenerating the resulting bed of adsorbent in the presence of a reducing gas comprising dihydrogen which reducing gas is free of a substantial amount of carbon monoxide, to effect release of the impurities from the adsorbent.

20. The process according to claim 18 wherein the adsorbent comprises at least about 90 weight percent of a gamma alumina having surface area in a range of from about 150 to about 350 square meters per gram as measured by the BET gas adsorption method, the metal dispersed on the support material is palladium, and the absorbent has a palladium content in a range of from about 0.01 to about 10 percent based on the total weight of the adsorbent, and wherein the gaseous mixture, while passing through the bed, is at temperatures in a range of from about 5°C to about 50°C.